The $7Q_{10}$ of 192 ft^3/s was determined using equation 5, which may tend to average a 15-day tidal cycle, short-term local impacts of wind and tides, and the unknown effects of storage between the tributary streams and the AICW. If the $7Q_{10}$ is decreased by the standard error of estimate of equation 5 as an approximation of the lower limits of variability not described by equation 5, the $7Q_{10}$ would be 139 ft^3/s. The corresponding 7-day average mile position of the saltwater-freshwater interface would be at mile 356.3, by extrapolation of equation 12.

The relation shown in figure 19 or equation 12 can also be used to estimate the movement of the saltwater-freshwater interface as a result of withdrawing water from the AICW. If a 7-day average of 30 Mgal/d (45 ft^3/s) was withdrawn from the AICW, the $7Q_{10}$ discharge would be reduced from 192 ft^3/s to 147 ft^3/s. The location of the interface for a 7-day average discharge of 147 ft^3/s is at mile 356.2 ±1.0 miles. Therefore, removal of 30 Mgal/d during a period in which the $7Q_{10}$ discharge was experienced will cause a 0.7 mile southern migration of the interface at high-slack water. If flows were decreased from the lower limit of 139 ft^3/s by 45 ft^3/s to 94 ft^3/s, the corresponding interface would be at mile 357.3.

A relation of daily maximum intrusion (X_m) in AICW mileage of the saltwater-freshwater interface during the 7-day averaging period to the 7-day average of the maximum daily mile position (X_7) using 1982-86 data is shown in figure 22 and by the least-squares regression equation:

$$X_m = 1.01\ X_7 - 2.71 \qquad (13)$$

Equation 13 has a standard error of estimate of 0.44 miles, a correlation coefficient of 0.95, and a coefficient of determination of 0.90. Figure 22 also shows that the daily maximum intrusion can also be obtained by simply adding one mile to X_7.

The city of Myrtle Beach has proposed locating a water treatment plant and intake in the vicinity of mile 363.3. Equations 12 and 13 can be used to test several scenarios of the location of the maximum intrusions of the interface during the $7Q_{10}$. The maximum daily intrusion of the interface during a $7Q_{10}$ of 192 ft^3/s (fig.12) would be at mile 356.3, 7.0 miles downstream (north) of the withdrawal point. If the $7Q_{10}$ were reduced by a withdrawal of 45 ft^3/s (30 Mgal/d) to 147 ft^3/s, the maximum daily intrusion would be at mile 357.0, 6.3 miles downstream from the withdrawal point. If the lower bound of the standard error of estimate in figure 12 was used as a "worst case" estimate of the $7Q_{10}$, the $7Q_{10}$ would be 139 ft^3/s and the maximum daily intrusion of the interface would be at mile 357.2, 6.1 miles downstream of the withdrawal point. If 45 ft^3/s were withdrawn during the "worst case" $7Q_{10}$, the maximum daily intrusion of the interface would be at mile 358.2, 5.1 miles downstream of the withdrawal point.

The freshwater supply potential and location of the saltwater-freshwater interface is based on the assumption that the tributary streams and the AICW will continue to respond as they have during the period 1954-86. Changes in withdrawal or reservoir release patterns in the tributary streams or additional withdrawals from the AICW will alter the relations that have been developed based on historic data.